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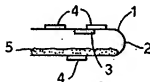
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(54) Security document

(57) A security document comprising a laminate or construction (1) of at least two layers between which is provided information (3) readable under non-visible irradiation.

At least the portions of the layers on either side of the information (3) are partially opaque to visible radiation. The security document may comprise an entrance ticket, transaction card, identity card, bank cheque or the like. The document is tamper evident.

Fig. 1.



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## Description

The invention relates to security documents such as identification cards, financial transaction cards, passports and the like.

Many security documents have to satisfy international standards concerning their size and layout. This severely limits the ability to store information on the document, while providing certain data is undesirable from an aesthetic point of view. For example, bar codes are useful for verification purposes but are generally disliked by card issuers as being detrimental to the appearance of the card.

In accordance with the present invention, a security document comprises a laminate or construction of at least two layers between which is provided information readable under non-visible irradiation, at least the portions of the layers on either side of the information being partially opaque to visible radiation.

With this invention, we propose that information should be incorporated within the body of the document between layers which, at least in the region of the information, are partially opaque to visible irradiation. The layers need to be sufficiently opaque so that the information does not interfere with the appearance of printing on the outer surface(s).

Thus, in some examples, the outer surfaces of the at least two layers carry visible indicia. These surfaces will typically be outer surfaces of the document. This may include information relating to the card issuer, expiry date and other conventional information, and security indicia.

In other cases, the laminate or construction may comprise more than two layers and visible indicia may be provided on any one or more of these layers. Furthermore, the laminate or construction may include one or more transparent cover layers for protecting the visible indicia.

Although in some cases the at least two layers may be (partially) opaque only where they cover the information, conveniently each layer has the same degree of opacity throughout. The at least two layers may be made of paper or synthetic materials well known in the art.

Typically the information is provided before assembly of the laminate or construction. This makes it necessary to disassemble the assembled document (for instance by pulling apart the at least two layers) in order to tamper with the information, or add further information. This results in a tamper proof document.

Typically the information is pre-printed with a suitable ink, for instance on an inner surface of one of the at least two layers. Examples of suitable printing techniques are offset printing, lithographic printing, flexographic printing and screen printing.

The information is preferably readable under infrared radiation although by suitable choice of inks other types of radiation could be used.

The information itself may be of any known type including, for example, bar codes (both one and two dimensional), characters readable by OCR etc.

Typically, the information is characteristic of the holder of the document. This information could include personal data on the holder, including photographic images, or some other form of data which verifies the documents authenticity and ties it to the holder.

Examples of security documents to which the invention applies include printed currency, travellers cheques, bank cheques, vouchers, financial tokens, tickets, passports, pass books, licenses, share certificates, bonds, letters of credit, legal documents, certificates of authenticity or regulatory compliance, brand protection labels, excise seals, identity cards, passes, permits, travel tickets, entrance tickets, lottery tickets, bingo tickets, financial transaction cards and identification documents and cards.

Some examples of security documents according to the invention will now be described with reference to the accompanying drawings which are all schematic, cross-sections through four different examples.

Figure 1 illustrates a first example of a security document such as an identification card comprising a paper substrate 1 which has been folded at 2 to define a laminate structure. An inwardly facing surface of the paper substrate 1 has been printed at 3 with a bar code in infrared responsive inks. The outwardly facing surface of the substrate 1 is printed in a conventional manner at 4 with other indicia relating to the card such as the card issuing authority, expiry date and the like. The folded sides of the substrate 1 are laminated together using an adhesive 5 to generate an integral structure.

When the card is viewed under normal light, only the printing 4 will be visible since the substrate 1 is sufficiently opaque under these conditions to mask the underlying bar code 3. However, when the card is viewed under infrared radiation, the printing 4 will not respond (and hence not be visible) but the radiation will pass through the paper substrate 1 which is partially transparent at these wavelengths and the inks making up the information 3 will respond so that the bar code 3 can be sensed from the other side of the card using a suitable detector. This allows the information at 3 to be read and then used in a conventional way either for manual or automatic verification purposes.

It will be understood that although the paper substrate 1 has been shown folded in Figure 1, it could be formed as a laminate of two separate sheets.

Figure 2 illustrates a modification of the example shown in Figure 1 in which an additional paper substrate 6 is provided between the folded sides of the substrate 1 and carries the information 3. In all other respects the construction of the card shown in Figure 2 is the same as in Figure 1.

In the examples shown in Figures 1 and 2, the normally visible printing 4 is printed directly on an outwardly facing surface of the substrate 1. In Figure 3, some of this printing 4 is provided on an additional paper sheet 7 which is laminated to substrate 1.

In all the examples, an additional, transparent cover sheet could be provided on either side of the laminate

and Figure 4 illustrates a modification of the Figure 1 example in which such transparent cover sheets 8 are provided.

Typically, the infrared readable information 3 is printed using a laser printer and suitable infrared responsive inks although other printing methods could be used such as IR absorbers in a thermal transfer ribbon.

In the examples described, the entire substrate 1 is partially opaque to visible radiation. However, in some cases, it is permissible for parts of the substrate 1 to be transparent to visible radiation providing those parts overlying the information 3 remain sufficiently opaque. In addition, the printing 4, at least where it overlies the information 3, should be printed with inks which are not responsive to infrared radiation.

#### Claims

1. A security document comprising a laminate or construction (1) of at least two layers between which is provided information (3) readable under non-visible irradiation, at least the portions of the layers on either side of the information (3) being partially opaque to visible radiation.
2. A document according to claim 1, wherein an outwardly facing surface of at least one of the two layers carries visible indicia (4).
3. A document according to claim 1 or claim 2, wherein the laminate or construction includes more than two layers.
4. A document according to claim 3, wherein visible indicia is provided on at least one layer (6) other than the said at least two layers.
5. A document according to claim 3 or claim 4, wherein at least one transparent cover layer (8) is provided.
6. A document according to any of the preceding claims, wherein the said at least two layers are partially opaque to visible irradiation throughout their extent.
7. A document according to any of the preceding claims, wherein the said at least two layers are made of paper or a synthetic plastics.
8. A document according to any of the preceding claims, wherein the non-visible irradiation comprises infrared radiation.
9. A document according to any of the preceding claims, wherein the information comprises one or more of a bar code and optically readable characters.
10. A security document according to any of the preceding claims, in the form of a passport, identification card or financial transaction card.
11. A document according to any of the preceding claims, wherein the information is characteristic of the holder of the document.
12. A method of manufacturing a security document, the document being according to any of the preceding claims, the method comprising providing the information (3) on a surface, and assembling the laminate or construction such that the information (3) is provided between the at least two layers.
13. A method according to claim 12 wherein the information (3) is provided on the surface before assembly of the laminate or construction.
14. A method according to claim 13 wherein the information (3) is pre-printed on a substrate, and wherein the laminate or construction is assembled by folding the substrate after the pre-printing step to define the at least two layers whereby the printed information lies on an inner surface of one of the at least two layers.
15. A method according to claim 12 or 13 wherein the information is provided on at least one layer (6) other than the said at least two layers.

Fig.1.

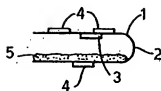


Fig.2.



Fig.3.

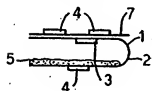
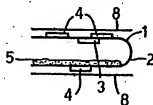


Fig.4.





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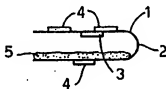
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**Fig.1.**



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## EUROPEAN SEARCH REPORT

Application Number  
EP 96 30 0145

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	EP-A-0 552 047 (HITACHI MAXWELL) 21 July 1993 * the whole document * -----	1-6, 8-13, 15	B42D15/00 B41M3/14
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B42D B41M
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 9 December 1996	Examiner Evans, A
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document</p> <p>Y: theory or principle underlying the invention E: earlier patent document, not published on, or after the filing date D: document cited in the application L: document cited for other reasons</p> <p>A: member of the same patent family, corresponding document</p>			

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